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8-29-02

Law Offices Of
JOHN W. HATHAWAY, PLLC
3401 BANK OF AMERICA TOWER • 701 FIFTH AVENUE • SEATTLE, WASHINGTON 98104
PHONE: 206/624-7100 FAX: 206/624-9292 EMAIL: djameson@seanet.com

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August 1, 2002

TO:	Lanna Mai, S.P.E. Group 3619	703/872-9326
FROM:	Deborah Jameson	206/624-9292
RE:	Conrad O. Gardner Serial No. 08/896/514	PAGES 39 (INC. THIS PAGE)

Dear Ms. Mai:

Our client, Conrad O. Gardner, registration number 22462, has requested that we retransmit the following pages to you regarding Serial No. 08/896/514:

Pages 157-161 containing claims 30-33
Pages 179-180 containing claim 25
Pages 24-55 containing the Appeal Brief

Please notify me immediately if you do not receive this transmission or if any portion of the file is illegible.

Very truly yours,

Deborah Jameson

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

New claims 30-33 have been entered as follows:

30. In combination, a hybrid motor vehicle comprising:

an electric motor connected to a first pair of wheels;

a cruise mode control circuit having preprogrammed cruise mode operating conditions, said control circuit automatically activating first coupling means for connecting a combustion engine to a second pair of wheels during a cruise mode on condition and deactivating said first coupling means during a cruise mode off condition, and said control circuit activating second coupling means for connecting said combustion engine to an electric generator for charging a battery during the cruise mode off condition;

CCC 1

a CO detector mounted on said vehicle for measuring the CO level in the vicinity of said vehicle;

a vehicle mounted transmitter for transmitting a signal indicative of the CO level measured by the CO detector;

an interactive information network located at a location remote from said motor vehicle, said network having receiver means for receiving said signal from said vehicle and transmitter means for transmitting a control signal to a receiver mounted on said vehicle when the measured CO level exceeds a predetermined level; and

control means responsive to the received control signal from said network for switching the cruise control circuit to the cruise mode off condition.

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31. The combination as set forth in claim 30, further including an exhaust emission analyzer for measuring the pollutant level of exhaust emissions from said combustion engine and connected to said vehicle transmitter for transmitting a signal indicative of the measured pollutant level to said network receiver means and said network transmitting said control signal to said vehicle mounted receiver when the measured pollutant level exceeds a predetermined level for switching the cruise control circuit to the cruise mode off condition.

32. In combination, a hybrid motor vehicle comprising:

an electric motor connected to a first pair of wheels;

CCC1

a cruise mode control circuit having preprogrammed cruise mode operating conditions, said control circuit automatically activating first coupling means for connecting a combustion engine to a second pair of wheels during a cruise mode on condition and deactivating said first coupling means during a cruise mode off condition, and said control circuit activating second coupling means for connecting said combustion engine to an electric generator for charging a battery during the cruise mode off condition;

an exhaust emission analyzer for measuring the pollutant level of exhaust emissions from said combustion engine;

a vehicle mounted transmitter for transmitting a signal indicative of the measured pollutant level;

an interactive information network located at a location remote from said motor vehicle, said network having receiver means for receiving said signal from said vehicle and transmitter means for transmitting a control signal to a receiver mounted on said vehicle when the measured pollutant level is above a predetermined level; and

control means located in said vehicle responsive to the received control signal from said network for switching the cruise control circuit to the cruise mode off condition.

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Serial No: 443204

Art Unit: 3106

33. The combination as set forth in claim 32, further including a CO detector mounted on said vehicle and connected to said vehicle transmitter for transmitting a signal indicative of the CO level in the vicinity of said vehicle to said network receiver means and said network transmitting said control signal to said vehicle mounted receiver when the measured CO level exceeds a predetermined level for switching the cruise control circuit to the cruise mode off condition.

CCC 1

Claims 1-29 have been cancelled.

Authorization for this examiner's amendment was given in a telephone interview with Conrad Gardner on March 31, 1997.

The following is an Examiner's Statement of Reasons for Allowance: The prior art does not teach applicant's hybrid vehicle having a cruise control circuit which disconnects the combustion engine from the second pair of wheels and connects the combustion engine to the electric generator during the cruise mode off condition, the cruise control circuit being controlled by a remotely located interactive information network which switches the control circuit to the cruise mode off condition in response to either the CO level in the vicinity of the vehicle being above a predetermined level or the the pollutant level of the exhaust emissions of the vehicle being above a predetermined level.

Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably accompany the

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PATENT APPLICATION

I certify that on the date specified below, this correspondence is being deposited with the United States Postal Service in an envelope addressed to: Commissioner of Patents & Trademarks, Washington, D.C. 20231

Date 4/2/96 Conrad O. Gardner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Conrad O. Gardner
Appl. No.: 08/443,204
Filing Date: May 18, 1995

Art Unit : 2107
Examiner :
Docket Number : 95-004M
April 2, 1996

For: *EXTENDED RANGE MOTOR VEHICLE HAVING AMBIENT POLLUTANT PROCESSING*

Commissioner of Patents and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination, please make the following amendments in the application:

In the Claims

Please add the following claim:

25. In combination in a motor vehicle;
a combustion engine for powering said motor vehicle or charging a storage device;
a control circuit responsive to a vehicle operating condition for controlling said combustion engine for powering said motor vehicle or charging a storage device.

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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKETT NO.
[illegible]	[illegible]	[illegible]	[illegible]

31M1/0401

CONRAD O GARDNER
2600 2ND AVENUE
SUITE 2103
SEATTLE WA 98121

MAR,M — EXAMINER

3106 — ART UNIT | PAPER NUMBER 13

04/01/97
DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) Conrad Gardner (3) _____

(2) _____ (4) _____

Date of Interview March 31, 1997

Type: ☒ Telephonic ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: _____

Agreement ☒ was reached with respect to some or all of the claims in question: ☐ was not reached.

Claims discussed: New claims 30-33

Identification of prior art discussed: _____

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: New claims drawn to the CO and pollutant level responsive means on the vehicle would be allowable and would be entered by examiner's amendment.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☐ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

Michael Mar
Examiner's Signature

PTOL-413 (REV. 2-93) 1/1

APPLICANT'S COPY

Serial No: 443204

Art Unit: 3106

Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Any inquiry concerning this communication should be directed to Michael Mar at telephone number (703) 308-2087.

Kevin Hurley 3/31/97
KEVIN HURLEY
PRIMARY EXAMINER
GROUP 3100

M. Mar

3-31-97

I certify that on the date specified below this correspondence is being deposited with the United States Postal Service with sufficient postage as first-class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231.

Date 1/04/01 Conrad O. Gardner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Conrad O. Gardner	Group Art Unit:	3619
Application No.:	08/896,514	Examiner:	M. Mar
Filing Date:	06/23/97	Docket No.:	95-004M
		Date:	Jan 4, 2001

For: Extended Range Motor Vehicle Having Ambient Pollution Processing

Attention: Board of Patent Appeals and Interferences
Assistant Commissioner for Patents
Washington, D.C. 20231

BRIEF ON APPEAL

Sir:

Applicant files this Brief on Appeal in triplicate within the two month period for such response following the filing of a Notice of Appeal on November 28, 2000.

A check in the amount of $ 155.00 is enclosed for filing this Brief (small entity).

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is the applicant.

II. RELATED APPEALS AND INTERFERENCES

Applicant does not know of any other appeals or interferences that directly affect or will be directly affected by the Board's decision in this appeal.

III. STATUS OF CLAIMS

1. Claims pending: 30-41 and 46-61
2. Claims withdrawn from consideration: 30-33
3. Claim allowed: 61
4. Claims rejected: 34-41 and 46-60
5. Claims on appeal: 34-41 and 46-60

IV. STATUS OF AMENDMENTS

Amendment after Final Rejection filed October 26, 2000 entered by Advisory Action Dated November 9, 2000.

V. SUMMARY OF THE INVENTION

A precise summary of the invention appears at page 2, lines 16-26 of the specification.

VI. ISSUES

1. Whether claims 55-60 are indefinite under 35 USC 112.

2. Whether claim 55 is anticipated by Kenyon (U.S.P. 4,438,342) under 35 USC 102(b).

3. Whether claim 55 is anticipated by Kim (U.S.P. 4,953,646) under 35 USC 102(b).

4. Whether claims 55-60 are anticipated by Ellers (U.S.P. 4,923,025) under 35 USC 102(b).

5. Whether claims 34, 35,37, 40 & 50-54 are unpatentable over Ellers (U.S.P. 4,923,025) under 35 USC 103(a).

6. Whether claim 36 is unpatentable over Ellers (U.S.P. 4,923,025) in view of Fields et.al (U.S.P. 4,351,405) under 35 USC 103(a)

7. Whether claims 38, 39 & 41 are unpatentable over Ellers (U.S.P. 4,923,025) in view of Miyake et al (U.S.P. 5,048,374) under 35 USC 103(a).

8. Whether claims 46-49 are unpatentable over Kenyon (U.S.P. 4,438,342) in view of Lynch et al (U.S.P. 4,165,795) under 35 USC 103(a).

VII. GROUPING OF CLAIMS

Each claim stands separately; arguments for the patentability of each claim appear in

the Argument section.

VIII. ARGUMENT

1.Whether claims 55-60 are indefinite under 35 USC 112.

The Examiner argues (Point 2, page 2 of the Final Rejection, Paper Number 40) that:

"Claim 55 is vague and unclear as to what power source provides the "instant powerful acceleration" and what is meant by "the cruise mode". The recitation " when the speed of the vehicle is dropping" is also vague and unclear.

Claim 55 has been amended by the Amendment after Final Rejection which was entered by Advisory Action and now reads:

55. A method of operating a hybrid vehicle having electric motor and internal combustion engine power comprising:

a. rapidly capturing power from a continuously running low horsepower internal combustion engine to charge a fast charge-discharge battery without loss of power; and,

b. providing instant powerful acceleration by operator depression of the throttle pedal to provide electric propulsion while in the cruise mode when the speed of the vehicle is dropping.

The meaning of every term used in the claim questioned by the Examiner is apparent from the descriptive portion of the specification 608.01(o) M.P.E.P. Also " The specification can always be used to learn the meaning of a term in the patent claim" In Re Boylan, 392 F.2nd 1017, 157 USPQ (CCPA 1970) at M.P.E.P. 804 (column 2).

In any event, applicant has now included the answer to the question of " how instant

powerful acceleration is provided while in the cruise mode when the speed of the vehicle is dropping" in the claim, viz. by operator depression of the throttle pedal to provide electric propulsion".

The term " cruise mode" is defined throughout applicant's specification including several pages of description, see e.g. page 4 beginning at line 29 through page 7, line 16 where cruise mode of operation is detailed and described in the preferred embodiment.

"fast and instant powerful acceleration when operating in the cruise mode" is accomplished by the operator quickly depressing the throttle pedal" finds basis and meaning e.g. at page 7, lines 19-24 where a fast pass is necessary to overtake another vehicle.

See also page 10 with reference to Figure 2. beginning at line 20 on where conditions occurr during climbing a mountain pass at t=6 minutes where " instant powerful acceleration" becomes necessary through utilization of electric propulsion as claimed.

See also page 13, line 15 relating to High Performance, High Torque Demand Situations.

Claim 56

The Examiner in the Final Rejection raises the question " within a small range of speeds" is unclear as to whether vehicle speed or engine speed (rpm) is being referred to.

Claim 56 language is explicit viz. " a. operating the internal combustion engine within a small range of speeds about its most efficient operating speed from a power and pollutant output standpoint". The phrase is self explanatory, it's the engine and not the vehicle speed.

Claim 57

In the Amendment after Final Rejection (See Appendix A where the claim in final form appears it should be noted that antecedent basis for "cruise mode" has been provided.

Claim 58

In the Amendment after Final Rejection (See Appendix A where the claim in final form appears) it should be noted that the internal combustion engine for the hybrid motor vehicle is defined as having a horsepower rating of approximately 20 to 30 % of the horsepower rating of an equivalent weight internal combustion only powered vehicle. The hybrid motor vehicle defined in claim 58 is very specific in that horsepower rating is only 20 to 30% for the claimed hybrid compared to whatever the vehicle power would be for an internal combustion powered vehicle of equivalent weight.

Claim 60

Antecedent basis for the term "cruise mode" was provided in the Amendment after Final Rejection which was entered by Advisory Action (See claim 60 in final form at Appendix A).

Claims 55, 56, & 59

Recitation of the term " fast charge-discharge battery" in the present hybrid vehicle was deemed vague and unclear.

Claim 55 in clause (a) as seen in Appendix A states in the method of operating the present hybrid vehicle, " a. rapidly capturing power from a continuously running low horsepower internal combustion engine to charge a fast charge-discharge battery without loss of said power" (See page 10, line 2 on). Fast charge-discharge batteries such as NiCd or NiMH are capable of rapid charging compared to lead acid batteries used in earlier electric powered vehicles which were slow charging, were of limited

range and required overnight charging. A fast charge-discharge battery such as a nickel cadmium (NiCd) exemplary of fast charge-discharge batteries was included in the language of Claim 56. A slow charging battery such as lead acid batteries would not be able to capture energy at a rapid rate without major loss of power from the low horsepower internal combustion engine when in the charging mode. See page 7, at line 8 where fast charge-discharge batteries are distinguished form lead acid batteries. See also page 8, beginning at line 26 where the importance of fast charge-discharge battery characteristics in the present system is further described.

ISSUES (Cont.)

2. Whether claim 55 is anticipated by Kenyon (U.S.P. 4,438,342) under 35 USC 102(b)

Kenyon, for sudden acceleration provides a switching mode where battery and alternator are in series electrically and connected across the motor 54 (Column 4, line 17). Parallel feed is changed to series feed (column 4, line 27). Kenyon does not specify a cruise mode but merely references parallel and series operation. Claim 55 in response to the depression of the throttle pedal provides "electric propulsion while in the cruise mode when vehicle speed is dropping", a specific transition is not shown in Kenyon within the meaning of 35 USC 102(b).

Further, no disclosure in Kenyon is found with respect to clause a. of Claim 55 relating to a charging system utilizing a fast charge-discharge battery receiving power from an internal combustion engine with optimum power transfer.

3. Whether claim 55 is anticipated by Kim (U.S.P. 4,438,342) under 35 USC 102(b).

Kim is simply a hybrid of series configuration with engine 1 driving a generator to propulsion motors with speed of propulsion simply controlled by accelerator control

of the engine. Claim 55 calls for operator depression of the throttle pedal to provide electric propulsion to provide instant acceleration " while in the cruise mode where the speed of the vehicle is dropping". Kim does not disclose throttle control in the claimed cruise mode condition.

4. Whether claims 55-60 are anticipated by Ellers (U.S.P. 4,923,025) under 35USC 112 b

Ellers provides an electric motor driving the hybrid in a low speed range and an internal combustion engine driving the vehicle at a predetermined and selected higher speed range such as 55 mph. The internal combustion engine drives a generator "only when battery voltage is below 5.25 volts per 6 volt battery (col 2, lines44-50). At 55 mph, the engine 2 is started (col4, lines 1-7). The Ellers system requires the vehicle to " be driven approximately 30% of its mileage over 55 mph (on ICE) the batteries would never need charging from an outside source" (col 4, line 67 to col 5, line 2.

As a consequence the Ellers vehicle is unsuitable for city driving alone where vehicle speeds exceeding 55 mph are not reached 30 % of the time.

In contrast, claims 55-60 are specifically drawn to a system where cruise mode conditions, e.g. claim 57 defines 2 conditions for utilizing the internal combustion engine in the cruise mode, not a predetermined speed alone (55 mph as in Ellers). The electric motor in the cruise mode as called for in claim 60 is responsive to vehicle operating parameters and not the single parameter of engine speed as Ellers.

Ellers operates the internal combustion engine at speeds above 55 mph e.g.at 60 mph 70 mph etc. in contrast to the invention as defined in claim 56 where the internal combustion engine is maintained under controlled conditions (including speed) for effective pollution control. Further, nothing in Ellers describes "utilization of the

internal combustion engine to charge a fast charge-discharge battery when the internal combustion engine is not employed to drive the motor vehicle " thereby providing extended range as specified in claim 55.

Claim 58 specifies a method of operating a hybrid motor vehicle including 2 steps, neither of which is in any manner described by Ellers viz. (a) a limited range of horsepower for the internal combustion engine, not the amount of horsepower which increases above 55 mph to whatever speed the operator desires as Ellers and (b) specific operating parameters for the engine in the cruise mode. Features (a) and (b) are not shown in Ellers and therefore the claim is allowable within the meaning of 35USC102 b.

A fast charge-discharge battery is not mentioned in Ellers as powering the electric motor on throttle demand nor is " power transferred into electric power in a fast charge-discharge battery when the internal combustion engine continues to run" as called for in claim 59.

As seen in the preceding, claims 55-60 are not met by Ellers within the meaning of 35 USC 112(b).

ISSUES (Cont.)

6. Whether claims 34, 35, 37 & 50-54 are unpatentable over Ellers (U.S.P. 4,923,025)

under 35 USC 103 (a)

Claim 34

The Examiner considers (in paragraph 7 of the Final Rejection) that Ellers provides a "cruise mode on condition" and a "cruise mode off condition" above and below 55 mph.

The cruise mode control circuit of claim 34 specifies preprogrammed operating conditions (plural and not a single condition as predetermined speed in Ellers). The Examiner states " The internal combustion engine being a small engine with no throttle control, would operate at a constant speed for maximum efficiency and minimum pollution". This is contrary to Ellers because Ellers provides speeds above 55 mph utilizing throttle control. Claim 35 is dependent upon claim 34 and allowable as claim 34.

Claims 37 and 40

The Examiner concludes on page 5 of the Final Rejection with respect to claim 37 and 40 That " It would have been obvious to program the control circuit of Ellers to always connect the engine to the generator during the cruise mode condition to maintain a fully charged battery. This conclusion of obviousness is erroneous for two reasons, first Ellers specifies the voltage level when the battery requires charging, and further there is no reason to " always connect the engine during cruise mode off condition to charge the battery in Ellers continuously" since this would be a large waste of engine power when the battery does not indicate a low voltage need in Ellers for charge.

Claim 50

The Examiner states with respect to claim 50: " With respect to claim 50, since the cruise mode is set only when the vehicle has reached a predetermined speed, it would have been obvious to activate the cruise mode only after a predetermined period of time in which rapidly shifting power and speed demands have not occurred in order to provide a consistent speed for the cruise mode". The " cruise mode" of Ellers is fixed at a predetermined speed and is not dependent as claimed in claim 50 upon a plurality of conditions nowhere taught or suggested by Ellers within the meaning of 35 USC 103 a.

Claim 51

Ellers charges the battery when the charged state of the battery is low as pointed out by the Examiner on Page 6 of the Final Rejection, a common practice in the motor vehicle art. Claim 51 specifies a charging system where the electric motor is powering the vehicle at lower speeds and the engine is continuing to operate supplying power to the battery to prevent prevent its discharge contrary to Ellers where the engine is used when necessary to charge at a predetermined low voltage level of the battery.

Claim 52

Claim 52 is dependent from claim 50 and allowable at least for the same reasons as claim 50 while further definitive of cruise mode operating parameters.

Claim 53

Claim 53 is believed identical in format to the claim indicated as allowable in an interview held with the Examiner on November 10, 1998 (See APPENDIX B). Claim 53 defines cruise mode operating conditions nowhere shown, taught or suggested by Ellers and is believed allowable within the meaning of 35 USC 103 (a).

Further regarding the patentability of claims 34, 35, 37, 40, and 54 over Ellers under 35 USC 103 (a), applicant introduces the AFFIDAVIT OF PHILIP C. MALTE UNDER RULE 132 attached as APPENDIX C.

6. Whether Claim 36 is unpatentable over Ellers (U.S.P. 4,923,025) in view of Fields et al (U.S.P. 4,351,405) under 35 USC 103 (a)

Claim 36

Claim 36 is dependent from claim 34 and believed allowable as claim 34.

7. Whether claims 38, 39 & 41 are unpatentable over Ellers (U.S.P. 4,293,025) in

view of Miyake et al (U.S.P. 5,048,374) under 35 USC 103 (a).

Claims 38, 39 & 41 are dependent from claim 37, therefore claims 38, 39 & 41 contain all the limitations of claim 37 and therefore the evaluation of these claims should consider claim 37 limitations also.

Claim 38

Control means (30) of claim 38 is not an automatic transmission with a plurality of shiftable speed stages. the automatic transmission being capable of shifting from an operating speed stage to another operating speed stage and capable of maintaining an operating speed stage when in normal condition (See preamble of claim 1 of Miyake et al). Claim 38 relates to a period set for transfer and is not concerned with maintaining an operating speed stage.

Claim 39 depends from claim 38 and defines a period. There is no period set in the automatic transmission of Miyake et al who is concerned with shifting through operating speed stages while maintaining an operating speed stage.

Claim 41 is dependent from claim 40 and defines a running state as a vehicle speed of about 40 mph. The Examiner states at page 7, lines 7-10 of the Final Rejection: " With respect to claims 41 and 45, it would have been further obvious to set the speed at which the combustion engine is activated to that of 40 mph in order to maintain a higher battery charge, thereby permitting extended use of the electric motor at lower speeds".

This is incorrect as the claim is dependent from claim 40 which is in turn dependent From claim 37 which relates to transfer of engine power from wheels to a generator and not the actuation of the combustion engine at 40 mph. The second portion of the

above sentence stating " thereby permitting extended use of the electric motor at lower speeds" is an adoption of the teachings of applicants specification where combustion engine utilization in conjunction with a fast charge-discharge battery e.g. a nickel cadmium battery during cruise mode off condition permits " extended use of electric motor at lower speeds" viz. extends the range beyond the teachings of the reference hybrid systems of the prior art of record.

8. Whether claims 46-49 are unpatentable over Kenyon (U.S.P. 4,438,342) in view of Lynch et al (U.S.P.4,165,795) under 35 USC 103 (a).

Claim 46

The Examiner states in the Final Rejection (under item 10 beginning at page 7) that: "It would have been obvious to provide the hybrid vehicle of Kenyon with a transmission between the clutch and driven wheels as taught by Lynch et al in order to provide a more efficient use of engine power".

Kenyon specifies due to features of his invention, "a gear ratio of 1:1 may be maintained from engine 10 to differential 14 which assures maximum efficiency for the power train (See col 3, lines 32-35). Accordingly it is not understood why the transmission of Lynch et al would be an "obvious substitution in Kenyon in order to provide a more efficient use of engine power" as stated by the Examiner. Switches are used in Kenyon and neither Kenyon nor Lynch et al show the logic control circuit functioning during disengagement of the clutch called for in claim 46. Claims 47 and 48 depend from claim 46 and are deemed patentable as claim 46.

In view of the preceding, applicant respectfully requests the Board of Appeals to find

the appealed claims allowable.

Respectfully submitted,

Conrad O. Gardner
Registration No. 22,462
Tel.: (206) 655-7997

121 Vine Street Suite 2202
Seattle, Washington 98121

APPENDIX A

CLAIMS ON APPEAL

34.In combination, a hybrid motor vehicle comprising:

an electric motor connected to a first pair of wheels;

a cruise mode control circuit having preprogrammed cruise mode operating conditions, said control circuit automatically activating first coupling means for connecting a combustion engine to a second pair of wheels during a cruise mode on condition and deactivating said first coupling means during a cruise mode off condition, and said control circuit activating second coupling means for connecting said combustion engine to an electric generator for charging a battery during the cruise mode off condition;

said combustion engine running in an optimum mode at substantially constant speed and power output level.

35. The combination according to claim 34 wherein said cruise mode off condition for charging a battery comprises a speed less than a predetermined value.

36.The combination according to claim 34 wherein in the event of an inoperable electric power condition under cruise mode off condition, said combustion engine is connected by said first coupling means to said second pair of wheels.

37. A controller of a hybrid electric vehicle having an engine (22) and a motor (12) for controlling driving of the engine (22) and the motor (12),

comprising:

a battery (58) for supplying electric power to the motor (12) ;

motor-generated driving force transfer means (14) for transferring the driving force generated by the motor (12) to wheels (18);

a power generator (78) driven by the engine (22) to supply generated electric power to the battery (58);

engine-generated driving force transfer means (75) for transferring the driving force generated by the engine (22) to the wheels (28);

means for detecting a vehicle running state (44) ; and

control means (30) for controlling whether to transfer a driving force generated by an engine (22) to a power generator (78) or wheels (28) in accordance with a vehicle running state, wherein the control means (30) transfers the driving force generated by the engine (22) to wheels (28) when said running state is more than a predetermined value, transfers the driving force generated by the engine (22) to the power generator (78) when said running state is less than a predetermined value.

38. A controller according to claim 37 wherein said control means (30) sets a period for transferring driving forces generated by the engine (22) to wheels (28) when said running state changes from [a value less than a predetermined value to] a value less than a predetermined value to a value larger than the predetermined value.

repeated, should be canceled

39. A controller according to claim 38 wherein said period is about 45 seconds.

40. A controller according to claim 37 wherein said running state is vehicle speed.

41. A controller according to claim 40 wherein said vehicle speed is about 40 miles per hour.

46. A hybrid vehicle power train comprising an engine and an electric motor;

a first torque flow path including a clutch and transmission coupled between said engine and traction wheels of the hybrid vehicle;

a second torque flow path coupled between the electric motor and traction wheels of the hybrid vehicle; and,

a logic control circuit for interrupting torque flow in said first torque flow path without interrupting operation of said engine

during disengagement of said clutch and application of torque through said second torque flow path to the traction wheels of the hybrid vehicle.

47. A hybrid vehicle power train according to claim 36 wherein said traction wheels comprise four-wheel drive.

48. A hybrid drive vehicle power train according to claim 46 wherein in the event of an inoperable electric motor, said first torque flow path provides torque to traction wheels of the hybrid vehicle.

49. A hybrid vehicle power train according to claim 46 wherein said logic control circuit controls the period of torque transfer between said first and second torque flow paths to traction wheels of the hybrid vehicle.

50. A hybrid motor vehicle comprising in combination:

an electric motor propulsion system which shifts to combustion engine propulsion for vehicle operation when cruise mode is reached;

said cruise mode occurring when rapidly shifting power and speed demands are

not occurring for predetermined periods of time.

51. A hybrid motor vehicle comprising in combination:

an engine;

an electric motor;

a storage device;

said electric motor powering said hybrid vehicle at lower speeds;

said engine powering said vehicle at higher speeds; and said engine operatively connected through a charging path for charging said battery at lower speeds.

52. A hybrid motor vehicle according to claim 50 wherein said speed demands do not drop below 40 mph for predetermined time periods of 45 seconds.

53. In combination in a motor vehicle having a pair of wheels at one end of the vehicle and a pair of wheels at an opposite end of the vehicle:

an electric motor for powering one of said pair of wheels;

a low power combustion engine for powering the other one of said pair of wheels;

a battery for storing electrical energy; and,

a cruise mode control having preprogrammed cruise mode operating conditions which includes a vehicle operating speed exceeding a predetermined level and for a predetermined time interval, said control circuit automatically coupling said electric motor to one of said pair of wheels when said cruise mode operating conditions have been satisfied, coupling said combustion engine to one of said pair of wheels when said cruise mode operating conditions have been satisfied, and decoupling said combustion engine from said one pair of wheels when said cruise mode operating conditions have not been satisfied;

said cruise mode control circuit adapted to maintain said combustion engine in a constant on mode, to couple said combustion engine to an electric power generator for charging said battery when cruise mode conditions have not been satisfied, and to decouple said combustion engine from said electric power generator when said cruise mode conditions have been satisfied.

54. In combination in a hybrid vehicle;

an electric motor;

a combustion engine;

a cruise mode logic control circuit;

said cruise mode logic control circuit responsive to a plurality of vehicle operating parameters including vehicle speed and accelerator pedal information for providing cruise mode logic output control signals for controlling operation of said electric motor and said combustion engine.

55. A method of operating a hybrid vehicle having electric motor and internal combustion engine power comprising:

a. rapidly capturing power from a continuously running low horsepower internal combustion engine to charge a fast charge-discharge battery without loss of said power, and,

b. providing instant powerful acceleration by operator depression of the throttle pedal to provide electric propulsion while in the cruise mode when the speed of the vehicle is dropping.

Should be 56 55. A method of operating a hybrid motor vehicle having an electric motor and an internal combustion engine comprising:

a. operating the internal combustion engine within a small range of speeds about its most efficient operating speed from a power and pollutant output standpoint; and,

b. utilizing the internal combustion engine to charge a nickel cadmium fast charge-discharge battery when the internal combustion engine is not employed to drive the motor vehicle.

should be 57 — 56. In the method of operating a hybrid motor vehicle having internal combustion engine power and electric motor power in the cruise mode and when cruise mode conditions are not satisfied;

a. utilizing the internal combustion engine power in said cruise mode and utilizing the electric motor power primarily when conditions for said cruise mode conditions are not satisfied, the cruise mode occurring when rapidly shifting power and speed demands are not occurring.

58. A method of operating a hybrid motor vehicle having an electric motor and an internal combustion engine comprising:

a. utilizing an internal combustion engine having a horsepower approximately 20 to 30 percent of the horsepower of an equivalent weight internal combustion only powered vehicle; and,

b. operating said internal combustion engine at relatively constant speed and load demands in the cruise mode.

59. In combination in the method of operating a hybrid vehicle having an electric motor and an internal combustion engine:

a. causing a fast charge-discharge battery to power the electric motor on throttle

demand; and,

b. transferring power output into electric power conserved in a fast charge-discharge battery when the internal combustion engine continues to run.

60. A method of operating a hybrid motor vehicle having an electric motor and an internal combustion engine operable in the cruise mode comprising:

controlling operation of the hybrid vehicle in said cruise mode including controlling the operation of the electric motor and internal combustion engine in response to vehicle operating parameters.

61. A hybrid vehicle comprising:

an engine for propelling the hybrid vehicle, said engine having an output shaft;

power transfer means for transferring an output power of said engine from the from the output shaft thereof to drive wheels of the hybrid vehicle;

an electric motor for propelling the hybrid vehicle, said electric motor having an output shaft;

second power transfer means for transferring an output power of said electric motor from the output shaft thereof to drive wheels of the hybrid vehicle;

2nd pos. recitation

means for coupling said power transfer means (which?) for transferring an output power of said electric motor from the output shaft thereof to drive wheels of the hybrid vehicle upon starting the hybrid vehicle;

means for uncoupling said power transfer means for transferring an output power of said engine from the output shaft thereof to drive wheels of the hybrid vehicle upon starting the hybrid vehicle; and,

means for coupling said power transfer means for transferring an output power of said engine from the output shaft thereof to drive wheels of the hybrid vehicle when the hybrid vehicle increases above a predetermined speed.

APPENDIX B

Interview with Examiner Mar dated November 2, 1998

Interview Summary	Application No. 08/896,514	Applicant(s) Conrad O. Gardner
	Examiner Michael Mar	Group Art Unit 3611

All participants (applicant, applicant's representative, PTO personnel):

(1) *Michael Mar* (3) _____

(2) *Conrad Gardner* (4) _____

Date of Interview *Nov 2, 1998*

Type: ☐ Telephonic ☒ Personal (copy is given to ☒ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description:

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: *46 and 50*

Identification of prior art discussed:

Description of the general nature of what was agreed to if an agreement was reached, or any other comments:

A claim defining the cruise mode operation and the hybrid vehicle together with a terminal disclaimer would be allowable.

The other claims will be reviewed subject to an updated search.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendents which would render the claims allowable is available, a summary thereof must be attached.)

1. ☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a response to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

2. ☐ Since the Examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the interview unless box 1 above is also checked.

Michael Mar

Examiner Note: You must sign and stamp this form unless it is an attachment to a signed Office action.

In combination in a motor vehicle having a pair of wheels at one end of the vehicle and a pair of wheels at an opposite end of the vehicle:

an electric motor for powering one of said pair of wheels;

a low power combustion engine for powering one of said pair of wheels:

a battery for storing electrical energy: and

a cruise mode control having preprogrammed cruise mode operating conditions which includes a vehicle operating speed exceeding a predetermined level and for a predetermined time interval, said control circuit automatically coupling said electric motor to one of said pair of wheels when said cruise mode operating conditions have not been satisfied, coupling said combustion engine to one of said pair of wheels when said cruise mode operating conditions have been satisfied, and decoupling said combustion engine from said one pair of wheels when said cruise mode operating conditions have not been satisfied;

said cruise mode control circuit adapted to maintain said combustion engine in a constant on mode, to couple said combustion engine to an electric power generator for charging said battery when said cruise mode conditions have not been satisfied, and to decouple said combustion engine from said electric power generator when said cruise mode conditions have been satisfied.

APPENDIX C

Affidavit of Philip C Malte Under Rule 132

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	GARDNER, Conrad O.	Group Art Unit:	3611
Application No.:	08/896,514	Examiner:	Michael Mar
Filing Date:	June 23, 1997	Docket No.:	95-004M
		Date:	December 9, 1999

For: EXTENDED RANGE MOTOR VEHICLE HAVING AMBIENT POLLUTANT PROCESSING

AFFIDAVIT OF PHILIP C. MALTE UNDER RULE 132

Philip C. Malte, being duly sworn, deposes and states:

1. Philip C. Malte is Professor of Mechanical Engineering at the University of Washington, Seattle, Washington. This position has been held since 1983. In the 10 -year period prior to 1983, Philip C. Malte was Assistant Professor of Mechanical Engineering at Washington State University, Pullman, Washington, Associate Professor of Mechanical Engineering at Washington State University, and Associate Professor of Mechanical Engineering at the University of Washington. Additional positions held include Engineer (Martin Marietta Corporation), Senior Engineer (Rohr Industries), Senior Engineer and Chief Consulting Engineer (Energy International, Inc), and US Department of Energy (Faculty Rotator).

2. Philip C. Malte studied engineering at The University of Michigan, Ann Arbor, Michigan. The degrees received include PhD in 1971, Masters of Science in 1966, and Bachelor of Science in 1964.

3. Philip C. Malte has performed research and published in the field of Combustion since 1970. Focus of the research has been on the generation and control of pollutants in combustion systems, especially in gas turbine engines and piston engines.

4. Philip C. Malte has taught university courses on combustion engines and on combustion science and technology for approximately 25 years. The University of Washington course numbers are ME481 and ME424. Other courses taught deal with energy conversion.

5. Philip C. Malte has developed and maintained laboratories that support research and teaching on combustion and combustion engines. The Internal Combustion Engines Laboratory at the University of Washington includes dynamometer test stands with engines, including a multi-cylinder gasoline engine, a single-cylinder spark ignition engine, and two single-cylinder diesel engines.

6. Teaching on engines by Philip C. Malte has included traditional spark ignition and diesel engines, improvements in combustion for these engines, and alternatives to these engines. The latter topic includes hybrid-electric engines. Research on engines has dealt with combustion for land-based gas turbine engines and large-bore spark ignition engines, and alternative fuels for these engines.

7. Philip C. Malte is a Member of the American Society of Mechanical Engineers (ASME), The Combustion Institute (CI), and the Society of Automotive Engineering (SAE).

8. Publication by Philip C. Malte has occurred in the journals and proceedings of the ASME and the CI. Additionally, SAE papers have been written.

9. Familiarity with hybrid-electric propulsion for automobiles has been gained by Philip C. Malte through teaching and study of the subject.

10. Philip C. Malte keeps abreast of the state of the art in combustion engines and related fields.

11. The Examiner has stated that:

The definitions of the systems in claims 34, 35, 37, 40 & 50-54 are unpatentable over Ellers.

Ellers discloses a pre-programmed control 25 which activates the internal combustion engine 21 and the electric torque converter 35 for coupling the engine to the second pair of wheels 15 and 17 when the vehicle approaches a pre-selected desirable speed of 55 mph. Since Ellers describes the pre-selected desirable speed at which the engine is activated as a cruising speed (col. 1, lines 55-58), after this speed has been reached, the vehicle is in a condition which constitutes a "cruise mode on condition". When the speed drops below 55 mph, the control decouples the engine from the second pair of wheels. This condition constitutes a "cruise mode off condition". The control could also activate a second coupling 65 for connecting the engine to an electric generator 63 for charging a battery 5 during the "cruise mode off condition". The internal combustion engine 21, being a small engine with no throttle control, would operate at a constant speed for maximum efficiency and minimum pollution. With respect to claims 42-44, note the control system for using only the electric motor at speeds below the pre-selected desirable speed of 55 mph. As the vehicle approaches the pre-selected desirable speed, the control system activates the internal combustion engine and disconnects electric power to the electric motor. Since the electric motor is always operating below the pre-selected desirable speed, the speedometer 67 would function as a display device for indicating when the electric motor is powering the hybrid vehicle at the lower speeds. With respect to claims 37 and 40, the engine drives the wheels when the vehicle is above the pre-selected desirable speed. When the battery charge is

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low, the control switches to a second mode in which power from the engine is transferred to the generator.

It would have been obvious to program the control circuit of Ellers to always connect the engine to the generator during the cruise mode off condition in order to maintain a fully charged battery. With respect to claim 50, since the cruise mode is set only when the vehicle has reached a predetermined speed, it would have been obvious to activate the cruise mode only after a predetermined period of time in which rapidly shifting power and speed demands have not occurred in order to provide a consistent speed for the cruise mode. With respect to claim 51, since Ellers teaches using the engine to drive the generator whenever the charged state of the battery is too low, it would have been obvious to activate the engine for charging the battery, even during periods of low speed when the electric motor is used to power the vehicle.

12. Regarding claims 34, 35, 37, 40, and 50-54, Philip C. Malte states:

Reading of Ellers (#4,923,025) strongly suggests the Internal Combustion Engine (ICE) does not come into play (i.e., does not drive a set of wheels) until the vehicle has reached a desirable highway cruising speed, such as 55 mph. At this point, the electric drive of a set of wheels is shut off. Thus, at about 55 mph and above, the ICE will drive the vehicle, and below about 55 mph, the Electric Motor (EM) will drive the vehicle.

The claims of Gardner involve a cruise mode condition. The cruise mode condition consists of a desirable vehicle speed and a desirable steadiness of vehicle speed and power. This is much different than the desirable highway speed of Ellers. Gardner allows the ICE to come into play at urban driving conditions, not just highway driving speed. An example of the Gardner condition would be urban driving at about 40 mph vehicle speed. Additionally, Gardner requires a steadiness of operation in order for the ICE to drive the vehicle. This will allow a relatively small ICE to be used. Ellers, on the other hand, never mentions

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steadiness of operation. Furthermore, by Ellers, one would be strongly inclined to use a fairly large ICE, since it will be used for all running above about 55 mph – though the ICE could be aided by the re-energized electric motor for a high rate of acceleration of the vehicle on the highway. It is quite unlikely the ICE of Ellers will operate with as high of efficiency as the Gardner ICE, and it is unlikely Ellers' ICE will yield as much reduction in vehicle emissions as Gardner's ICE.

Reading of Ellers strongly suggests charging of the electric-drive battery by the ICE only occurs when the battery, on 6-volts basis, has a voltage of less than 5.25 volts. This is a significant drawback of the Ellers system. This drawback is brought out by the statement in Ellers: "It has been found that if the vehicle of the present invention is driven approximately 30% of its mileage over 55 mph (on ICE) the batteries would never need charging from an outside source." Gardner overcomes this difficulty. That is, the ICE is used to charge the batteries when the vehicle is in cruise-off mode condition. Gardner proposes a significantly more robust electric-drive battery recharging system. It is unlikely Gardener's system will require external charging, even if the vehicle is driven primarily in the urban environment.

Received from < 2648144 > at 8/1/02 2:45:10 PM [Eastern Daylight Time]

13. Conclusion

In my opinion, the definitions discussed by the Examiner in 11 are not obvious to those of ordinary skill in the art of automotive power plant design. It is not obvious the highway speed condition of Ellers should be broadened to include urban driving speeds and steadiness of operation. It is not obvious the electric-drive battery charging method of Ellers, in which the battery is charged by the ICE only when the electric-drive battery falls below 5.25 volts, should be replaced by a system that charges the battery when the vehicle is operating below the cruise speed condition.

Further, affiant sayeth naught.

Dated: 12/9/99

Philip C. Malte

STATE OF WASHINGTON)
) ss
COUNTY OF KING)

Subscribed and sworn to before me this 9th day of December, 1999.

JEAN ALISON BROUELETTE NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 1-23-01

Notary Public

My Commission Expires: 01-23-01

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Subscribed and sworn to before me this 9th day of December, 1999.

JEAN ALISON BROUELETTE NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES 1-23-01

Notary Public

My Commission Expires: 01-23-01

#191/2

I certify that on the date specified below this correspondence is being deposited with the United States Postal Service with sufficient postage as first-class mail in an envelope addressed to : Assistant Commissioner for Patents, Washington, DC 20231.

November 28, 2000 Conrad O. Gardner

Date

PTO/SB/31 (10-00)
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NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES	Docket Number (Optional) 95-004M

In re Application of Conrad O. Gardner

Application Number	Filed
08/896,514	06/23/97

For Extended Range Motor Vehicle Having Ambient Pollutant Processing

Group Art Unit	Examiner
3611	M. Mar

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the decision of the examiner dated, Aug. 29, 2000, rejecting the following claims: 34-41 and 46-60

The fee for this Notice of Appeal is (37 CFR 1.17(b)) $ 310.00

- [x] Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ 155.00
- [x] A check in the amount of the fee is enclosed.
- [ ] Payment by credit card. Form PTO-2038 is attached.
- [ ] The Commissioner has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.
- [ ] The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No._____. I have enclosed a duplicate copy of this sheet.
- [ ] A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

- [x] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [ ] attorney or agent of record.
- [ ] attorney or agent acting under 37 CFR 1.34(a). Registration number if acting under 37 CFR 1.34(a)._____

Signature

Conrad O. Gardner

Typed or printed name

Nov. 28, 2000

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[x] *Total of 1 forms are submitted.

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